Amendments to the Specification:

Please replace Paragraphs 0056, 0059, 0061-0064, and 0067 with the following replacement paragraphs:

[0056] Next, a predetermined radius tolerance level L is provided (step 68). The predetermined radius tolerance level may be calculated using a plurality of monitored implantation data (step 70) to ensure that an AMU of an ion being implanted has less than a 1 AMU, or preferably, less than a .5 AMU difference from a desired ion to be implanted. Preferably, the plurality of implantation data includes a plurality of ions each having a predefined AMU (m), wherein each of the plurality of ions is associated with a monitored B and a monitored [[V]] V_E.

[0059] A radius corresponding to the proper AMU of ion B_{11}, P_{31}, and $BF_{2(49)}$ equals the R_{am} of the analyzing magnet, i.e. 4.16 cm. Additionally, a plurality of radii were calculated using a +-.5 AMU and a +- 1 AMU difference from the proper AMU for each ion. As is shown in FIG. 7, even a +-.5 AMU change in the AMU of each ion adversely affects the radius of each ion, even though the +-.5 AMU change is a tighter tolerance than the +-1 AMU interlock provided in the traditional ion implanter.

[0061] The absolute value of the calculated radius offset between a B_{11} and a $B_{10.5}$ ion is |4.16 cm-4.07 cm|=.16 cm, additionally, the absolute value of the calculated radius offset between a desired B_{11} ion and an undesired $B_{11.5}$ ion is |4.16 cm-4.25 cm|=.09 cm. Thus, a tighter predetermined radius tolerance level L less than .09 cm is needed to prevent implantation of an

undesirable ion having an AMU within at least .5 of an AMU of a desired ion to be implanted.

[0062] Similar calculations can be performed to determine the absolute value of the offset for radii using the P_{31} and the $BF_{2(49)}$ ions. As is shown for the $BF_{2(49)}$ ion, an absolute value of a radius offset of .03 cm ($|R_{BF2(49)}$4.16 cm - $R_{BF2(49.5)}$4.19 cm$|$) still allows for a variance of .5 AMUs between an ion having an AMU of 49.5 and a $BF_{2(49)}$ ion. A tighter radius tolerance level, less than a 4.16 cm +- .03 cm, is needed to provide an ion having an AMU less than a .5 difference than a desired ion AMU.

[0063] Thus, as shown in the implantation data chart of FIG. 7, the desired predetermined radius tolerance level L using the present embodiment is set at least equal to .02 cm (step 74). Thus, the estimated real-time radius R_e of an ion being implanted should not vary more than .02 cm from the radius of the analyzing magnet (R_{am}). However, it is contemplated that a different predetermined radius tolerance level L may be calculated in a similar manner using a different ion implanter having a different fixed radius R_{am} of the analyzing magnet.

[0064] Therefore, in accordance with a preferred embodiment, a radius of an ion being implanted should be within the following range (4.16 cm-.02 cm) =< R_e =< (4.16 cm+.02 cm), i.e. 4.14 cm< R_e <4.16 cm, or R_e =<.02 cm. If R_e is outside of the predetermined radius tolerance level L, then, the AMU of the ion being implanted has an AMU that varies at least .5 AMU's from a desired ion's AMU. Such a variation in AMU of an ion AMU from a desired ion AMU means that an incorrect is present and thus, should be separated from the desired ion using the analyzing magnet.

[0067] FIG. 8 illustrates an enlarged view of an analyzer magnet having a fixed radius R_{am}. As shown in FIG. 8, heavier ions that have a radius R_1 that exceeds the R_{am}, 4.16 cm are deflected away from the beam current flowing through the analyzer magnet above the radius of the analyzing magnet towards a wall of the analyzer magnet. Additionally, lighter ions that have a radius R_2 that is less the R_{am}, 4.14 cm are deflected away from the beam current flowing through the analyzer magnet below the radius of the analyzing magnet towards a wall of the analyzer magnet.